

# Relationship between Online Learning Readiness and Structure and Interaction of Online Learning Students

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## Abstract

Current study tried to determine whether a relationship exists between readiness levels of the online learning students for online learning and the perceived structure and interaction in online learning environments. In the study, cross sectional survey model was used. The study was conducted with 320 voluntary students studying online learning post-graduate programs in Sakarya University. The participants were administered a questionnaire consisting of readiness for online learning, perceived structure and interaction in the study. The hypotheses of the research were tested with structural equation modeling. It was found at the end of the research that online learning students' readiness for online learning was positively related with their interactions in learning environments and negatively related with perceived structure. In addition, there appeared to be a negative relationship between perceived structure and interaction. In the study, it was found that readiness for online learning was important regarding the structure that affects learning results of students and interaction variables.

## Key Words

Online Learning, Readiness, Structure, Interaction.

Internet provides the opportunity to access intercultural and personalized knowledge for learning, to acquire theoretic knowledge and to explore and apply knowledge (Holmes & Gardner, 2006). Internet offers worldwide accessible knowledge (Broadbent, 2002) and learning applications (Aggarwal & Bento, 2000) in any time and place. One of the learning applications which has become widespread with the opportunities provided by internet is online learning.

Online learning can be defined as gaining knowledge and skills through synchronous and asynchronous learning applications which are written, communicated, active, supported and managed with the use of internet technology (Morrison, 2003). Online learning has become

one of the most benefited applications in higher education. More than 30% of the students in higher education in United States of America participate in online learning activities (Allen & Seaman, 2011).

To be able to have more effective and efficient results in online learning; a field which is increasingly becoming widespread; it is required to find learning theories addressing learning from educational and technical aspects. Equality, community of inquiry and transactional distance (TD) can be mentioned among the field-specific theories to be used in online learning. TD theory which can be used in both learning and teaching design stands out among these theories (Cicciarelli, 2008; Garrison, 2000; Saba, 2003).

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TD is "the psychological and communicative space which leads to potential misunderstandings between student and teacher behaviors; in other words it is not only a physical distance" (Moore & Kearsley, 2012). Concept of "distance" in the theory was related with two components, namely structure and dialogue. Constituent of structure means that the courses in distance learning programs include elements which are able to meet the individual difference and student needs and they are easily accessible (Saba & Shearer, 1994). Dialogue can be defined as thinking of the conflicting aspects of the content (Gorsky & Caspi, 2005a) and communication and interaction with other students and teachers (Gorsky & Caspi, 2005b). Moore (1989) started to address the dimension of dialogue as interaction in time and defined three interactions, namely, student-teacher, student-student and student-content interactions.

In a distance learning program, increase in dialogue leads to decrease in structure whereas increase in structure leads to decrease in dialogue (Chen, 2001; Moore, 1991). In studies examining this hypothesis of the theory, a negative relationship was found between structure and dialogue (Chen, 1997; Chen & Willits, 1998; Jung, Choi, Lim, & Leem, 2002; Hopper, 2000; Horzum, 2007, 2011). However, there are studies which found that structure dimension of the theory was not confirmed (Force, 2004; Gorsky & Caspi, 2005a; Kanuka, Collett, & Caswell, 2002; Lowell, 2004).

Since online learning is based on internet, it provides more flexible, less structured and interactive learning environments than traditional distance learning applications (Jung, 2000a, 2000b; Pauls, 2003).

There are many studies that investigate mainly online learning and TD sense in distance learning applications with internet and two variables of this sense which are dimensions of interaction and structure (Burgess, 2006; Horzum, 2007, in press; Lee, & Rha, 2009; Lowell, 2004; Moore & Kearsley, 2012; Pettazzoni, 2008; Rabinovich, 2009; Sandoe, 2005 etc.). In limited number of researches which study structure and interaction sense, it is seen that they are generally used as independent variable and it was studied which variables they affect (see Horzum, 2007, in press; Lee & Rha, 2009). However, there are not many researches on what interaction and structure are affected by and what they are related with.

Gender, learning style, strategy and approaches, technology use skill and readiness including learning through technology, etc. can be stated among the variables affecting structure and

interaction. Readiness stands out among these. TD is generally emphasized since it is a highly effective factor on previous experiences and readiness levels of the students regarding structure and dialogue (Chen, 2001; Horzum, 2007, in press; Moore & Kearsley, 2012).

Readiness is a variable which is often emphasized and measured in distance learning, e-learning and online learning researches (Fogerson, 2005; Horzum & Çakır, 2012; Hukle, 2009; Leigh & Watkins, 2005; McVay, 2000; Smith, 2000, 2005; Smith, Murphy, & Mahonay, 2003; Watkins, Leigh, & Triner, 2004).

In researches of Warner, Christie, and Choy (1998), Leigh and Watkins (2005) and Dray, Lowenthal, Miszkiewicz, Ruiz-Primo, and Marczyński (2011), it was found out that readiness for online learning should measure two qualities which are technology and student attributes dimension. When studies on readiness in online learning are examined, it is seen that readiness affects many variables (Davis, 2006; Fogerson, 2005; Gunawardena & Daphorne, 2001; Lau & Shaikh, 2012).

Although there are many studies on online learning, no studies was undertaken on the relationship between readiness levels of online learning students for online learning and perceived distance dimensions in online learning. The study was formed based on the following hypotheses:

1. Readiness levels of online learning students for online learning,
  - are significant predictors of perceived structure of students in online learning.
  - are significant predictors of perceived interaction of students in online learning.
2. The structure perceived by the online learning students in online learning is an important predictor of the structure they perceive in online learning.

## Method

The research was performed according to quantitative survey model. Population of the research consisted of 1180 students studying in 6 postgraduate learning programs of Sakarya University, Institutes of Social Sciences and Sciences. Convenience sampling method was preferred to select sample from this population. Sample of the research consisted of 320 online learning postgraduate students studying in master programs with thesis and without thesis in Sakarya University Institutes of Social Sciences and Sciences.

73 of the students (22.8%) in the study group were female and 247 (77.2%) were male. Average age of the students was between the age of 21 to 55 is ( $\pm SD$ )  $30.43 \pm 4.87$ . Students in the study had daily internet connection for half an hour to 20 hours.

The studies that used readiness scales were examined (Hung, Chou, Chen, & Own, 2010; McVay, 2000; Pillay, Irving, & Tones, 2007; Smith, 2005; Smith et al., 2003). Readiness Scale for Online Learning developed by Hung et al. was preferred since it is a more current, sufficiently short measurement tool including both dimensions of online learning. Translation of the scale into Turkish was conducted by researchers involved in the current study. Expert view was received on the conformity of the scale and structure validity of the scale was checked under another study. Fit indexes of the structure of the scale with five factors and 18 items as a result of confirmatory factor analysis for latent variables of online learning readiness are found as follows:  $\chi^2/df = 1.62$ , RMSEA = 0.044, SRMR = 0.053, CFI = 0.98, NFI = 0.95, NNFI = 0.97, GFI = 0.93 and AGFI = 0.91. Internal consistency coefficient of the Turkish form of the scale was found as .85.

Interaction and course structure, the two dependent variables in the research, were measured with Perception Scale for Online Courses. The scale was developed by Huang (2000; 2002) to measure the perception for online courses. Turkish adaptation of the scale was performed by Canan Güngören and Horzum (2012).

In the study, Pearson correlation coefficient and structural equation modeling were used to examine the relationship between readiness for online learning and perceived distance dimensions. All hypotheses of structural equation modeling were fulfilled in the study. Covariance matrix and Maximum Likelihood were used in the analysis. These analyses were carried out with LISREL 8.54 package program.

## Results

A positive and significant relationship was found between readiness for online learning and perceived interaction. In addition, a negative and significant relationship was found between structure and readiness for online learning and interaction. After these findings, a model test was performed with structural equation modeling between three variables of the research: readiness for online learning, perceived interaction and structure. The model was found to be highly fit in the study ( $\chi^2 = 63.36$ , df = 29,  $\chi^2/df = 2.19$ ,  $p = .00000$ , GFI = .93, AGFI = .90, CFI = .95, NFI = .94, NNFI = .93, IFI = .95 ve RMSEA =

.061). In addition, 83% of the structure (ST) variance is explained by interaction (IT). 20% of the interaction variance is explained by readiness for online learning (ROL). Additionally, 36% of the readiness for online learning variance is explained by structure.

When the analyses were examined, self-directed learning and student control were found to be important variables in readiness. Although online communication tools and self-efficacy for internet as well as learning motivations are important in readiness, we see self-directed learning and control -the ability to take responsibility and manage learning process in online learning- as the factor which affects readiness. In readiness for online learning, self-efficacy for internet and computer was found to be the constituent with the least effect.

When the interactions of students in online learning were examined, interaction with the content was found to stand out more than interactions with teacher and with other students which are interpersonal interaction dimensions. Interaction with content was the interaction that allowed learners to get information from relevant materials.

## Discussion

In the research, first of all, a negative relationship was found between interaction and structure by online learning students. This finding means that when the interaction of online learning students with teachers, other students and content in the system increases, structure decreases.

As the interaction increases, the probability of students to be able to fulfill their individual learning needs also increases. In this aspect, it is expected that increase in interaction decreases structure. Structure consists of design of the course, content's being updateable, individual adaptability according to the needs of the students. Elements such as learning aims of the course, content constituents, information presentations, case studies, activities and tests constitute the structure elements. Being able to answer to the individual needs of the enrolled students regarding program depends on the flexibility of these elements (Moore & Kearsley, 2012). Increase in interaction leads to decrease in structure and meeting individual needs. The finding that there is a negative relationship between structure and interaction is consistent with the hypothesis of distance component of the Moore's transactional distance theory (Keegan, 1996; McIsaac & Gunawardena, 1996; Moore, 1991, 1993; Moore & Kearsley, 2012; Saba, 2003; Saba & Shearer, 1994; Simonson, Smaldino, Albright, &

Zvacek, 2006; Verduin & Clark, 1994) and findings of the relevant researches in the literature (Bischoff, Bisconer, Kooker, & Woods, 1996; Braxton, 2000; Chen, 1997; Chen & Willits, 1998; Jung et al., 2002; Hopper, 2000; Horzum, 2007, 2011).

In the research, it was found that there is a negative relationship between readiness and structure. This finding means that increase in readiness of students for online learning leads to decrease in structure or decrease in readiness leads to increase in structure. Readiness for online learning consists of computer/internet self-efficacy, self-directed learning, student control, motivation for learning and online communication self-efficacy. In this aspect, knowledge and skills of the students for motivation, communication, control and independent learning in readiness for learning are important elements in meeting the individual needs of the students. It is an expected situation that students feel efficient to structure meanings in courses, to acquire correct knowledge and to use proper knowledge acquiring ways for their own learning. These findings are consistent with literature (Chen, 2001). Studies indicating that computer/internet experience/self-efficacy (Chen, 2001; Huang, 2000; Veale, 2009), student control (Lin & Hsieh, 2001), online communication (Huang, 2000; Veale) affect structure show similarities with the findings of this research.

In the research, it was found that there is a positive relationship between readiness of online learning and interaction. This finding means that increase in readiness of students for online learning leads to increase in interaction in the learning environment or decrease in readiness leads to decrease in interaction. These findings of the study are consistent with literature (Chen, 2001). The studies indicating that computer/internet experience/self-efficacy (Chen, 2001; Kou, 2010), self-directed learning (Kou), online communication (Huang, 2000) affect interaction show similarities with the findings of this research.

When the research model is examined, it is seen that most of the fit indexes in the model show good fit (Schermelleh-Engel et al., 2003). In addition, the projected model indicates the importance of increasing readiness to increase interaction and decrease structure in online learning. It was set forth once more that readiness should be increased to increase interaction in order to be able to create more effective learning in online learning, which is a finding consistent with literature (Hung et al., 2010).

In the research, the finding that readiness is effective in structure and interaction which affect learning results of online learning students stands out. In

this aspect, the suggestion is important that self-directed learning and student control which come to the prominence in readiness of online learning students should be increased. Gaining basic elements which include recognizing own qualities and needs when entering a program and taking responsibility to meet them is considered important for online learning students.

There are some limitations which affect the interpretation of findings and development of suggestions. The participants of this study consist of post-graduate online learning students. Bearing in mind that there are different factors affecting the motivations of post-graduate students, similar researches can be done in undergraduate level and comparisons can be made. In addition, the scales were applied via internet to access this study group.

In the application of the scales, connection to the scale was provided from the learning management system panel used by the students and participation was completely voluntary. This situation may have led to the fact that number of participants in the study group was low since some online learning students did not want to participate or were not willing to fill in the scale online. In addition, since participants in the study group include students studying in post-graduate education with or without thesis, the results are not considered to be generalized to graduate or undergraduate education groups. In this aspect, similar studies may be conducted with associate degree or undergraduate degree students.

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